

THE LIFE HISTORY OF *OLIARUS FELIS* KIRK (HOMOPTERA).

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(Plates XXVII-XXVIII.)

As this is the first complete life-history record in the genus *Oliarus*, full details are given of the conditions under which the insects were found. It is probable that an examination of similar situations in other countries will disclose subterranean habits among many other species of these cosmopolitan insects.

The capture of one or two examples at my home first drew attention to them. Subsequently others were taken by "sweeping" in the garden, where they appeared to be limited to the lower end. This part consists of a black, sticky, alluvial soil, while just beyond is a fringe of mangrove trees and the banks of a tidal creek. The only vegetation on this low-lying strip is the salt-water couch grass, *Sporobolus virginicus* var. *minor* Bail., which forms a dense mat over the area, owing to its being fenced off from stock.

At the roots of this grass, *Oliarus felis* Kirk. were found in numbers. Blocks of soil were cut out, and were readily broken apart where cracks occurred, displaying a white fibrous substance on both faces. In these cracks, early in April, were various-sized nymphs, and adults of both sexes. The white material consists of the filamentous tufts which are rubbed off the terminal abdominal extremity of the nymphs while moving about in the crevices. The attachment of these white tufts is extremely weak; they may be seen becoming detached when colonies are exposed, and the nymphs are pushing among the rootlets, trying to find fresh hiding places. The nymphs are very sensitive to light, and when exposed their chief object is to find some small hole or rootlet into which they may push their heads. After attaining this object they will remain quiet although the rest of their bodies are exposed to strong light.

Besides their delicate sensitiveness to light, the disparity between the thousands of these insects inhabiting each acre of grass roots, and the comparatively small number seen above ground or obtained in the sweep net, indicates that they are truly subterranean in their habits.

During the spring tides the place is saturated with brackish water, and for short periods is actually submerged for an hour or two daily. Several adults were seen climbing up the grass stems to avoid the water. No nymphs appeared, although they were numerous at the time. After the water receded some were dug up and were found to be apparently dry. No doubt the waxy secretion which covers their bodies renders them waterproof.

Another examination of the couch grass was made at the end of April, and many clusters of eggs were present in the crevices, each covered with its small white wad; a few females were seen at this time, but no males. On 12th May about one hundred young nymphs were seen while breaking

up two small blocks of turf, but only one egg-mass. Examination at different periods showed that, in November and April, adults of both sexes were plentiful; while at other times only nymphs were present.

Eggs.—Length .56 mm.; breadth .025 mm. Oval, subtranslucent, white. Microscopically the shell is quite smooth, and without any visible micropyle. They are not attached, but are loosely placed in clusters of forty to sixty in small cavities among the grass roots, under a circular wad-like mass of white filamentous material.

Nymphs.—Last instar, length 5.5 mm.; breadth 2.5 mm. The anal tuft when present adds another 3 or 4 mm. to the length; anterior and posterior extremities rounded, sides somewhat parallel; head small, pale brown, smooth in the middle, with two rows of sensory pits on each side; eyes moderately prominent; pronotum pale brown, anterior angles rounded and thickly studded with sensory pits; there is a longitudinal median white stripe running the length of the thorax and continuing in a fine line to the apex of abdomen; the pale-brown wing-pads each carry a short curved row of sensory pits; abdomen white, with a broad transverse pale-brown band on each segment; two sensory pits on the first, four on the second, and a transverse row on the third and fourth dorsal segments; ventral surface white. The young nymphs are entirely white.

Adults.—Female, length 4 mm., tegmen 5 mm. Vertex about as broad as long, a little broader at the base; lateral margins fork nearer the apex than the middle, forming a transverse convex carina; a short central carina at base of vertex which does not reach the transverse one; pronotum short dorsally, widening laterally, hind margin angularly emarginate; abdomen flattened; pygofer broader than long, the anal segment small, not so long as pygofer, about as long as broad, the styles small, not so long as pygofer; central portion of pygofer thickly studded with minute peg-like processes.

Paler than the male; clypeus, vertex, and sides of prothorax brownish black, keels and carinæ ochraceous; mesothorax dark brown, keels and a stripe on each side ferruginous; abdominal segments dark brown, apical borders and sides of each segment ochraceous; pygofer pale; tegmina hyaline, piliferous, veins yellowish, hairs and cross-veins brown. In fresh specimens the whole body is dusted with a pruinose material, making it appear greyish.

Male, length 3.5 mm., tegmen 4 mm. Tegmina, basal two-thirds hyaline, apical third fuscous. The periandrium is produced into a flat process; three curved spines arise from near base of penis, which is membraneous. Differs from the female in the smaller size, darker markings, and the dusky apical third of tegmina. Mr. F. Muir, who kindly identified this species, states that the type material consists of three males.

EXPLANATION OF PLATES.

Plate XXVII, Fig. 1.—Sod broken along a crack, exposing four nymphs. $\times 5$.

Plate XXVII, Fig. 2.—Sod broken along a crack, exposing three nymphs and an adult. $\times 5$.

Plate XXVIII, Fig. 3.—Egg-patch with covering removed exposing the eggs. $\times 10\frac{1}{2}$.

Plate XXVIII, Fig. 4.—Male genitalia, lateral view. $\times 54$.

Plate XXVIII, Fig. 5.—Adults, two females, and one male. $\times 8$.